

Trend Study 22-5-98

Study site name: Bone Hollow .

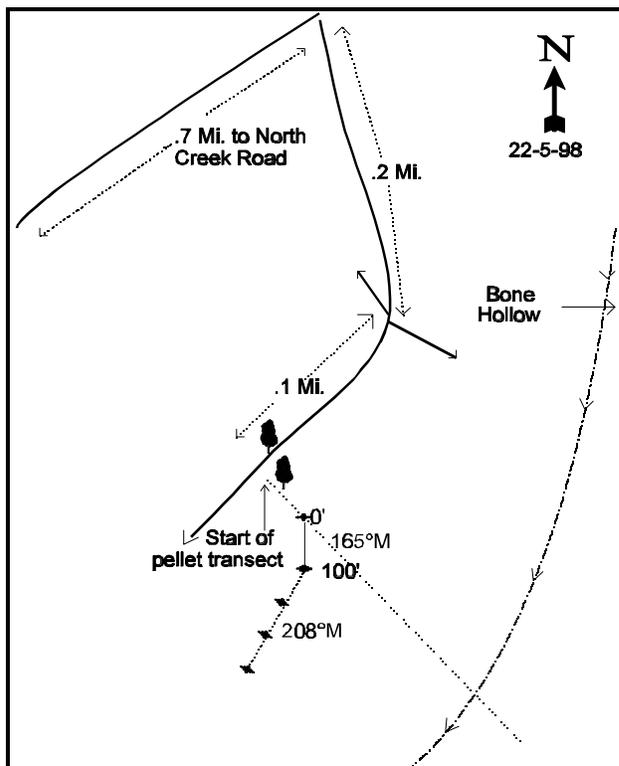
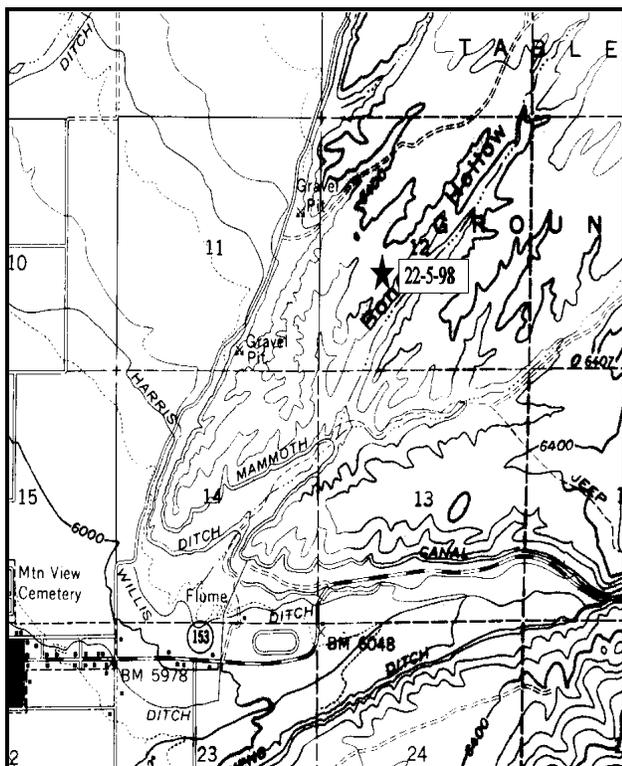
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 165 M degrees. Lines 2-4 208° M

Footmark (first frame placement) 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of the North Creek Road and SR153 on the east side of Beaver, go north 1.95 miles past an irrigation pond on the left to a gravel pit on the right. On the south side of the gravel pit a good dirt road goes northeast up the bottom of a draw (ignore the numerous other small dirt roads). Drive up this road 0.75 miles to a fork. Turn right onto another major dirt road and go south 0.2 miles to another major right turn (there is also a left fork and a hard right). Go 0.1 miles west just past where the road goes closely between two junipers. Look for a fencepost 50 feet to the left. The fencepost marks the start of a pellet group transect. The pellet group transect is marked by short yellow rebar running southeast at 25-foot intervals. The frequency baseline starts between pellet stakes 3 and 4 and is marked by a 3-foot rebar tagged #7048.



Map Name: Beaver, Utah

Diagrammatic Sketch

Township 29S , Range 7W , Section 12

UTM 4240484.709 N , 3604463463 E

## DISCUSSION

### Trend Study No. 22-5 (56A-1)

The Bone Hollow trend study samples an area of Wyoming big sagebrush and juniper administered by the BLM. The transect is located on a slight south facing slope at an elevation of 6,400 feet. This is typical of the untreated winter ranges on the benches above Beaver, which are historically important deer winter range. Deer use is moderate to heavy and varies somewhat from year to year depending on the winter weather. A pellet group transect read on the site in 1998 indicates 93 deer days use/acre.

The soil is moderately deep, fairly compacted, and very stony throughout. Average effective rooting depth (see methods) is estimated to be just over 12 inches with an average soil temperature of 49°F at almost 15 inches. Soil textural analysis indicates a sandy clay loam with a neutral pH (6.7). Plant development may be limited due to relatively low amounts of phosphorous (8.5 ppm). Past erosion is apparent with a high percentage of pavement (27%) and rock (6%) on the soil surface. Litter and herbaceous vegetation are found mostly under the sagebrush. The potential for continued erosion is high within the bare shrub interspaces.

A fairly dense and uniform stand of Wyoming big sagebrush, along with an open woodland of juniper and pinyon, gives this extensive area its vegetative aspect. The Wyoming big sagebrush is the only desirable browse species present. The junipers provide good cover and many have been high-lined. Browsing pressure continues to be moderate to heavy on the sagebrush. Seed production appeared low in both 1991 and 1998. In 1985, the age structure indicated a relatively dynamic population with 22% of the plants classified as young and a biotic potential of 19% in 1985. In 1991, only 5% of the plants were young and the biotic potential was 0. Percent decadency increased from 30% in 1985 to 33% in 1991. Also, the percentage of plants classified as dying accounted for 57% of the decadent portion of the population. In 1998, the population still exhibits a downward trend with percent decadency again increasing to 35% of the population. Currently, utilization continues to be moderate to heavy with the plants generally in good vigor. With extended drought, this problem is intensified by the dominance of cheatgrass in the understory. At present, it almost makes up 80% of the herbaceous cover. Other browse species scattered throughout the site in low abundance include: broom snakeweed, narrowleaf low rabbitbrush, and prickly pear cactus. Point-centered quarter data collected in 1998 estimates 39 pinyon trees/acre and 149 Utah juniper trees/acre.

A variety of grass species are found on the site. The most abundant is cheatgrass which provides 79% of the herbaceous understory cover and 40% of the total vegetative cover. Cheatgrass was encountered in every quadrat in 1998, with a nested frequency value of 379 out of a possible 400. The most abundant perennial grasses are bottlebrush squirreltail and Indian ricegrass. Most of the grass species, whether abundant or not, are found under the protection of the sagebrush.

Forbs occur sporadically throughout the community. They are mostly small and contribute little forage in the spring. Current utilization is light. Perennial herbaceous understory sum of nested frequency has changed very little over all years.

### 1985 APPARENT TREND ASSESSMENT

The soil trend may be slightly downward with erosion occurring in the openings and slow soil building under browse plants. The vegetative composition and age structures indicate a stable Wyoming sagebrush/grass community with slow pinyon-juniper encroachment. Cool season herbaceous species are conspicuously absent as a result of constant heavy spring grazing in the past. A chaining could be used to restore the area to a more productive state, but the rockiness of the surface soil would limit the success of broadcast seeding unless the soil is sufficiently disturbed.

## 1991 TREND ASSESSMENT

The soil trend is still considered slightly downward. Vegetative basal cover is still low at 4%. Rock-pavement cover has decreased, with percent bare ground rising to 19% and percent litter cover decreasing to 40%. There is only one key browse species, Wyoming big sagebrush, which has a 4% increase in its population density. The biotic potential has decreased and the young age class of plants has also decreased, but the percent of decadency is fairly stable and high. The percentage of plants classified as having poor vigor has more than doubled to 18%. The browse trend is slightly downward with the decline of the young age class and biotic potential. The trend for herbaceous understory is down as the sum of nested frequency is declining with the drought.

### TREND ASSESSMENT

soil - slightly down

browse - slightly downward

herbaceous understory - down, poor condition

## 1998 TREND ASSESSMENT

The soil trend is stable. There does not appear to be accelerated erosion on the site at this time. Percent bare ground cover has declined since 1991, as well as combined percent rock and pavement cover. Percent litter cover has increased to 48% in 1998, although much of the litter is comprised of fine fuels contributed by cheatgrass. The browse trend is slightly downward. Percent decadency has increased since 1991. Although the percentage of dying plants has decreased, there are still many dying plants encountered and few seedling or young plants were encountered in 1998. The herbaceous understory trend is stable with little change in perennial herbaceous understory sum of nested frequency. Cheatgrass is dominant and could carry a catastrophic fire where all the browse would be lost.

### TREND ASSESSMENT

soil - stable

browse - slightly downward

herbaceous understory - stable, but dominated by cheatgrass

## HERBACEOUS TRENDS --

Herd unit 22 , Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover % '98
		'85	'91	'98	'85	'91	'98	
G	Agropyron spicatum	1	3	1	1	1	1	.03
G	Bouteloua gracilis	1	-	12	1	-	4	.12
G	Bromus tectorum (a)	-	-	379	-	-	100	20.28
G	Oryzopsis hymenoides	50	35	34	22	20	16	1.51
G	Poa secunda	<sub>a</sub> -	<sub>b</sub> 11	<sub>a</sub> 2	-	6	1	.00
G	Sitanion hystrix	122	99	103	55	45	43	2.21
G	Stipa comata	9	12	11	4	5	6	.64
Total for Annual Grasses		0	0	379	0	0	100	20.28
Total for Perennial Grasses		183	160	163	83	77	71	4.52
Total for Grasses		183	160	542	83	77	171	24.80

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover % '98
		'85	'91	'98	'85	'91	'98	
F	Agoseris glauca	<sub>a</sub> 5	<sub>a</sub> 5	<sub>b</sub> 17	2	3	7	.11
F	Alyssum alyssoides (a)	-	-	9	-	-	3	.01
F	Antennaria rosea	-	3	4	-	1	2	.01
F	Arabis demissa	1	1	5	1	1	3	.04
F	Astragalus spp.	<sub>a</sub> -	<sub>ab</sub> 4	<sub>b</sub> 17	-	2	6	.10
F	Chaenactis douglasii	<sub>a</sub> 7	<sub>b</sub> 20	<sub>a</sub> 5	3	10	3	.01
F	Cryptantha spp.	10	20	-	5	9	-	-
F	Descurainia pinnata (a)	-	-	3	-	-	1	.00
F	Erigeron pumilus	<sub>b</sub> 10	<sub>a</sub> -	<sub>a</sub> 3	6	-	1	.00
F	Leucelene ericoides	-	7	5	-	3	2	.03
F	Machaeranthera canescens	<sub>b</sub> 11	<sub>a</sub> 2	<sub>a</sub> -	6	2	-	-
F	Microsteris gracilis (a)	-	-	1	-	-	1	.00
F	Phlox austromontana	<sub>ab</sub> 17	<sub>a</sub> 9	<sub>b</sub> 27	8	5	13	.23
F	Ranunculus testiculatus (a)	-	-	33	-	-	12	.16
F	Sphaeralcea coccinea	5	14	16	4	6	7	.22
Total for Annual Forbs		0	0	46	0	0	17	0.18
Total for Perennial Forbs		66	85	99	35	42	44	0.79
Total for Forbs		66	85	145	35	42	61	0.97

Values with different subscript letters are significantly different at  $\alpha = 0.10$  (annuals excluded)

#### BROWSE TRENDS --

Herd unit 22 , Study no: 5

Type	Species	Strip Frequency '98	Average Cover % '98
B	Amelanchier utahensis	-	.00
B	Artemisia tridentata wyomingensis	87	17.43
B	Chrysothamnus nauseosus	1	.03
	Chrysothamnus viscidiflorus stenophyllus	0	-
B	Gutierrezia sarothrae	4	.06
B	Juniperus osteosperma	11	4.32
B	Opuntia spp.	4	.03
B	Pinus edulis	2	2.65
B	Sclerocactus	1	-
Total for Browse		110	24.54

CANOPY COVER --

Herd unit 22 , Study no: 5

Species	Percent Cover '98
Juniperus osteosperma	9
Pinus edulis	2

BASIC COVER --

Herd unit 22 , Study no: 5

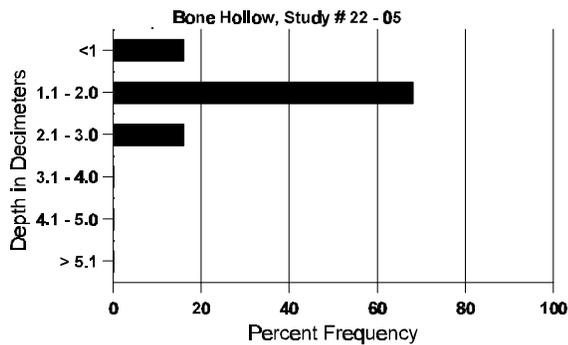
Cover Type	Nested Frequency '98	Average Cover %		
		'85	'91	'98
Vegetation	381	3.75	3.75	41.04
Rock	190	1.75	2.25	6.06
Pavement	315	42.75	35.25	27.36
Litter	397	43.00	39.75	48.47
Cryptogams	23	0	.50	.26
Bare Ground	253	8.75	18.50	14.31

SOIL ANALYSIS DATA --

Herd Unit 22, Study # 05, Study Name: Bone Hollow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.4	49.0 (14.9)	6.7	52.4	23.1	24.6	2.6	8.5	96.0	.7

### Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 22 , Study no: 5

Type	Quadrat Frequency '98
Rabbit	34
Deer	66
Cattle	1

BROWSE CHARACTERISTICS --

Herd unit 22 , Study no: 5

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
<i>Artemisia tridentata wyomingensis</i>																	
S	85	16	1	-	-	-	-	-	-	-	17	-	-	-	1133		17
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	98	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4
Y	85	12	6	1	-	-	-	-	-	-	18	-	1	-	1266		19
	91	4	1	-	-	-	-	-	-	5	-	-	-	333		5	
	98	9	1	-	-	-	-	-	-	10	-	-	-	200		10	
M	85	13	22	8	-	-	-	-	-	42	-	1	-	2866	15 15	43	
	91	13	31	11	2	-	-	-	-	56	1	-	-	3800	13 24	57	
	98	29	94	14	-	6	-	-	-	141	-	-	-	2860	17 27	143	
D	85	10	11	5	-	-	-	-	-	21	-	5	-	1733		26	
	91	13	9	2	5	-	-	1	-	12	1	-	17	2000		30	
	98	17	34	27	1	2	-	-	-	62	1	5	13	1620		81	
X	85	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	91	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	98	-	2	-	-	-	-	-	-	2	-	-	-	680		34	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'85		44%			16%			08%			+ 4%						
'91		45%			14%			18%			-24%						
'98		59%			18%			08%									
Total Plants/Acre (excluding Dead & Seedlings)											'85	5865	Dec:	30%			
											'91	6133		33%			
											'98	4680		35%			
<i>Chrysothamnus nauseosus</i>																	
M	85	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'85		00%			00%			00%									
'91		00%			00%			00%									
'98		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)											'85	0	Dec:	-			
											'91	0		-			
											'98	20		-			
<i>Chrysothamnus viscidiflorus stenophyllus</i>																	
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	91	-	1	-	-	-	-	-	-	1	-	-	-	66		1	
	98	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'85		00%			00%			00%									
'91		100%			00%			00%									
'98		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)											'85	0	Dec:	-			
											'91	66		-			
											'98	0		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4				
<b>Gutierrezia sarothrae</b>									
S	85	-	-	-	-	-	-	0	0
	91	-	-	-	-	-	-	0	0
	98	4	-	-	-	-	-	80	4
Y	85	-	-	-	-	-	-	0	0
	91	2	-	-	-	-	-	133	2
	98	-	-	-	-	-	-	0	0
M	85	-	-	-	-	-	-	0	0
	91	-	-	-	-	-	-	0	0
	98	5	-	-	-	-	-	100	5
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>				
'85		00%	00%	00%					
'91		00%	00%	00%	-25%				
'98		00%	00%	00%					
Total Plants/Acre (excluding Dead & Seedlings)					'85	0	Dec:	-	
					'91	133		-	
					'98	100		-	
<b>Juniperus osteosperma</b>									
S	85	-	-	-	-	-	-	0	0
	91	2	-	-	-	-	-	133	2
	98	8	-	-	1	-	-	180	9
Y	85	1	-	-	-	-	-	66	1
	91	1	-	-	-	-	-	66	1
	98	6	-	-	2	-	-	160	8
M	85	-	-	-	-	-	-	0	0
	91	-	-	-	-	-	-	0	0
	98	1	-	-	1	-	-	80	4
% Plants Showing		<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>				
'85		00%	00%	00%	+ 0%				
'91		00%	00%	00%	+73%				
'98		00%	00%	00%					
Total Plants/Acre (excluding Dead & Seedlings)					'85	66	Dec:	-	
					'91	66		-	
					'98	240		-	

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total									
		1	2	3	4		5	6		7	8	9	1	2	3	4		
Opuntia spp.																		
S	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	91	2	-	-	1	-	-	-	-	-	3	-	-	-	200			3
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	4	-	-	-	-	-	-	-	-	4	-	-	-	266	5	6	4
	98	3	-	-	1	-	-	-	-	-	4	-	-	-	80	5	10	4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%			+86%							
'91		00%			00%			00%			-83%							
'98		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'85	66	Dec:	-				
											'91	466		-				
											'98	80		-				
Pinus edulis																		
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%										
'91		00%			00%			00%										
'98		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'85	0	Dec:	-				
											'91	0		-				
											'98	40		-				
Sclerocactus																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	2	4	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%										
'91		00%			00%			00%										
'98		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)											'85	0	Dec:	-				
											'91	0		-				
											'98	20		-				